**FIG.1**
**Prior Art**

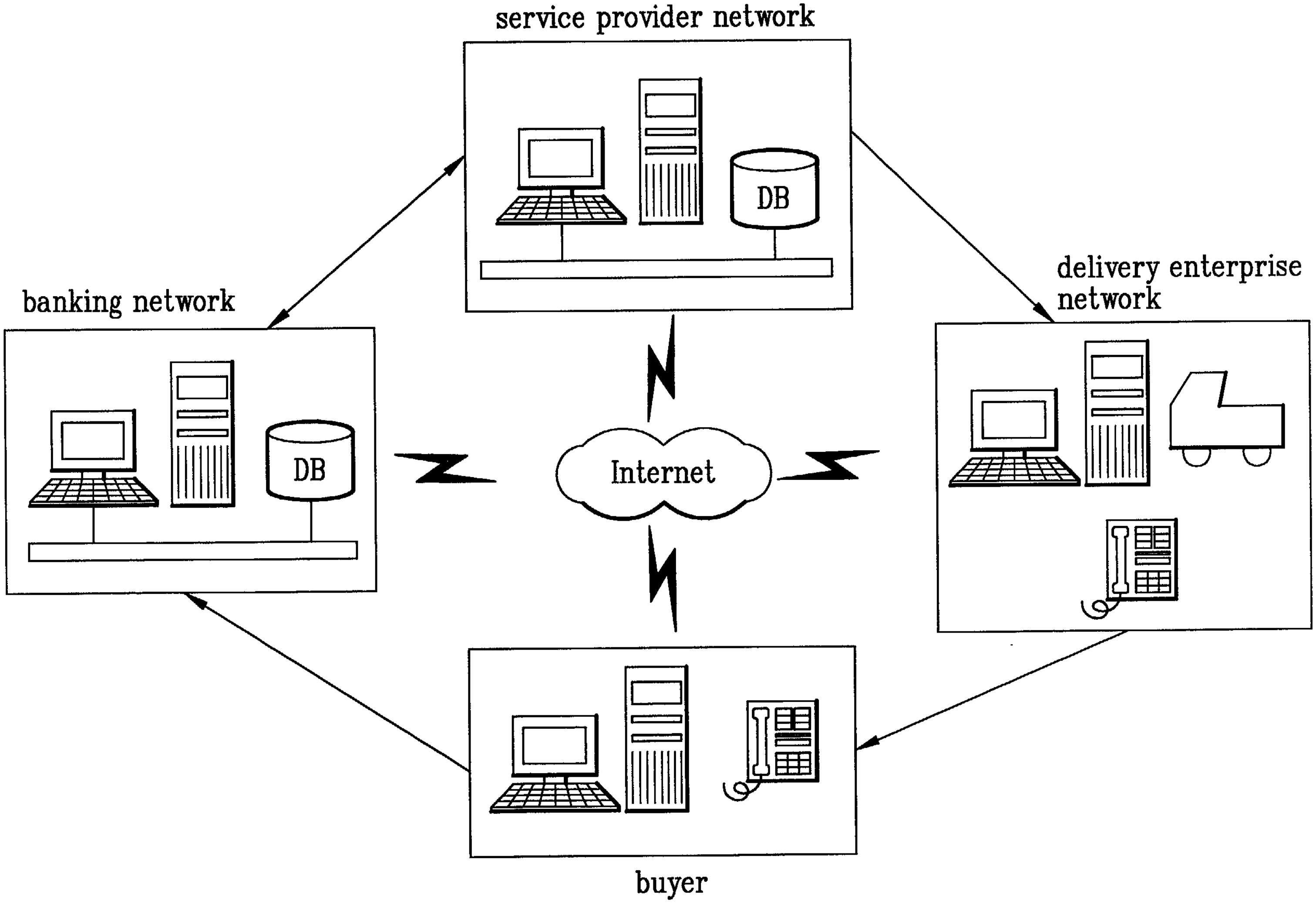


FIG.2
Prior Art

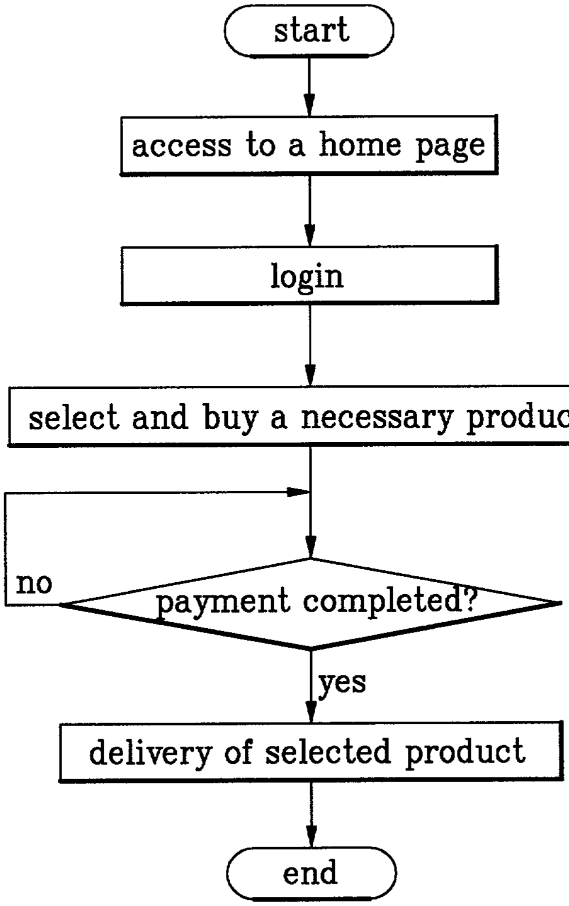
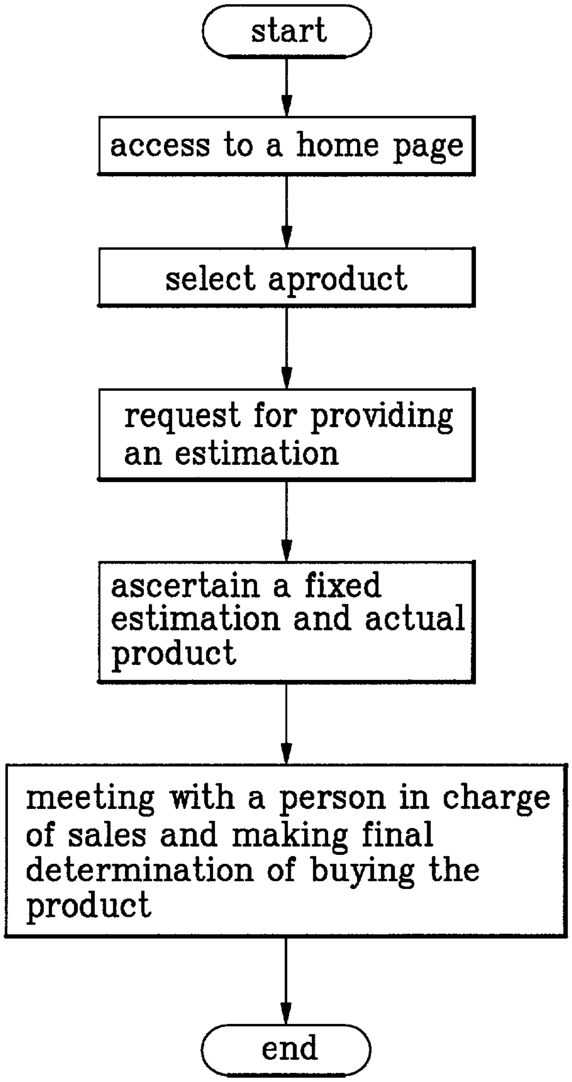


**FIG.3**
**Prior Art**



# FIG.4

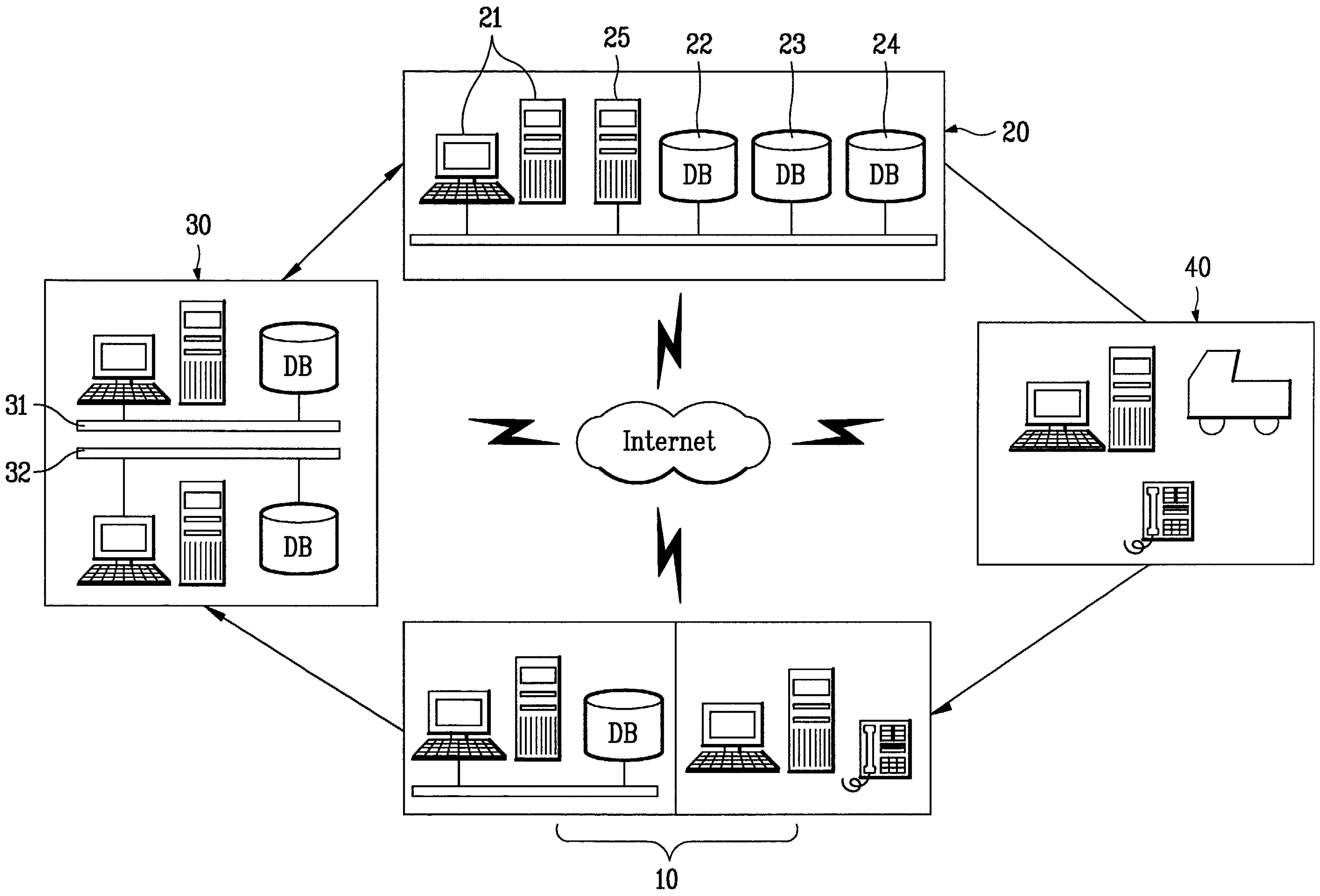


**FIG.5**

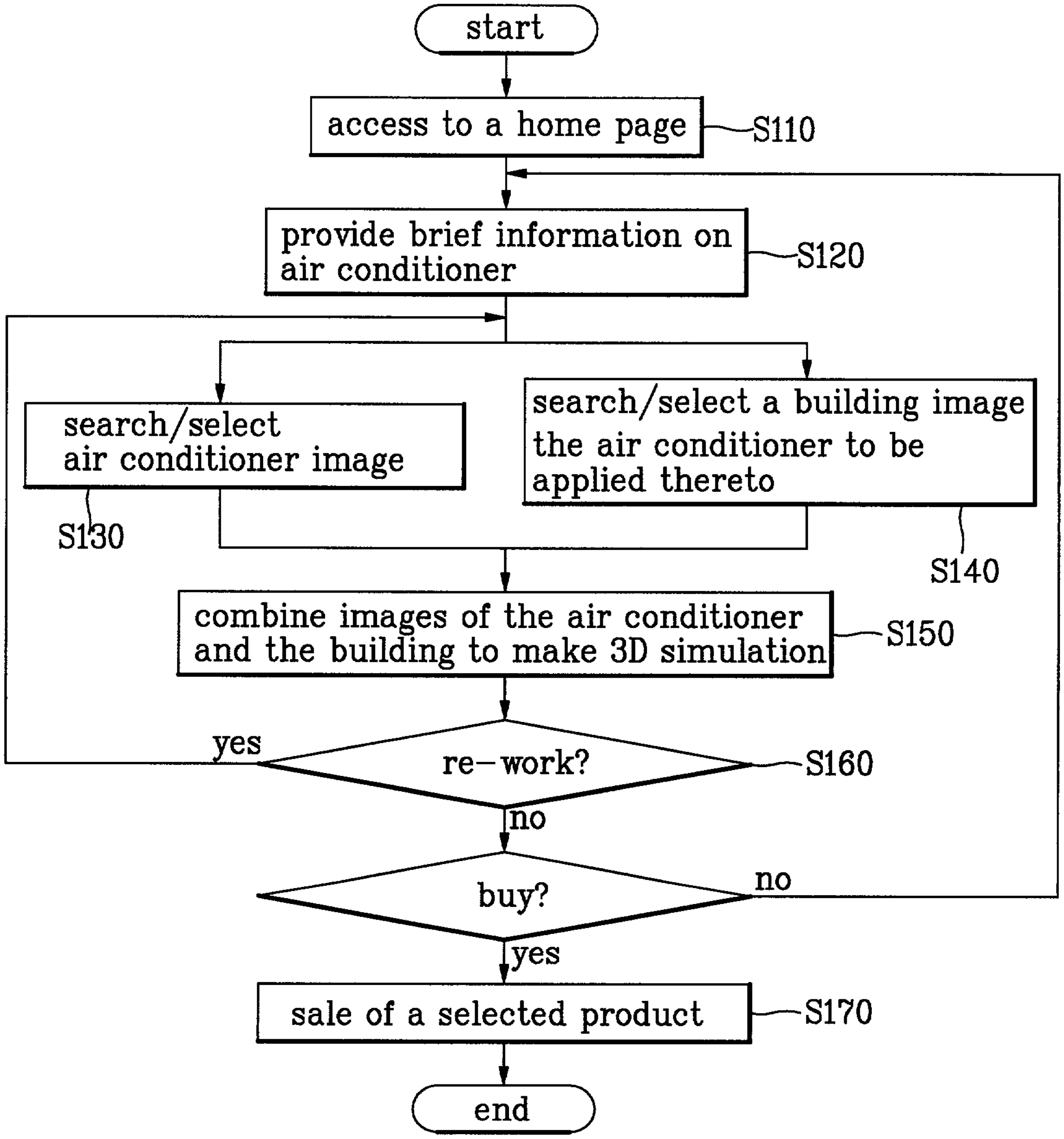

start
access to a home page
S110
provide brief information on air conditioner
S120
search/select air conditioner image
S130
search/select a building image the air conditioner to be applied thereto
S140
combine images of the air conditioner and the building to make 3D simulation
S150
re-work?
yes
no
S160
buy?
no
yes
sale of a selected product
S170
end

FIG. 6

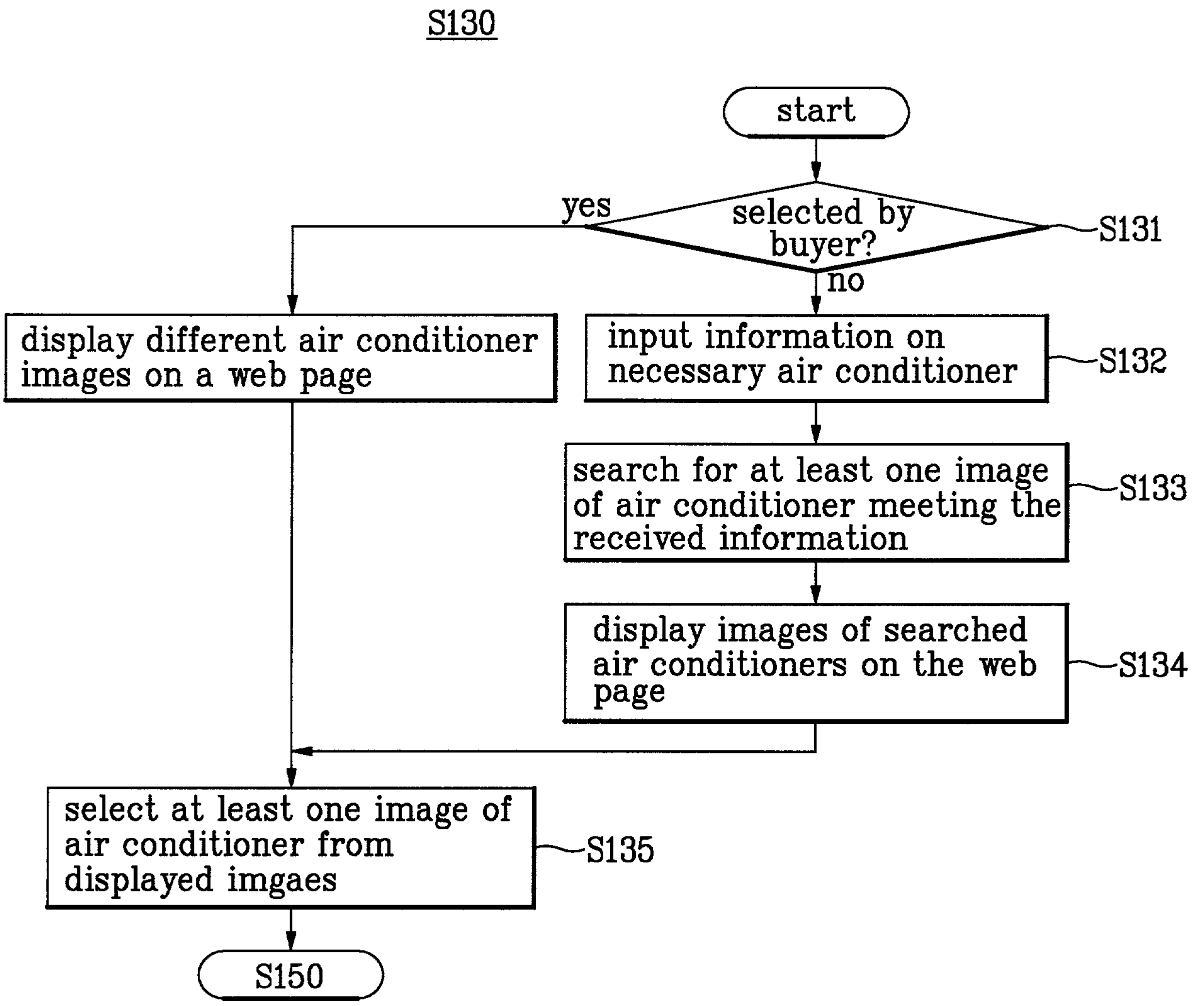
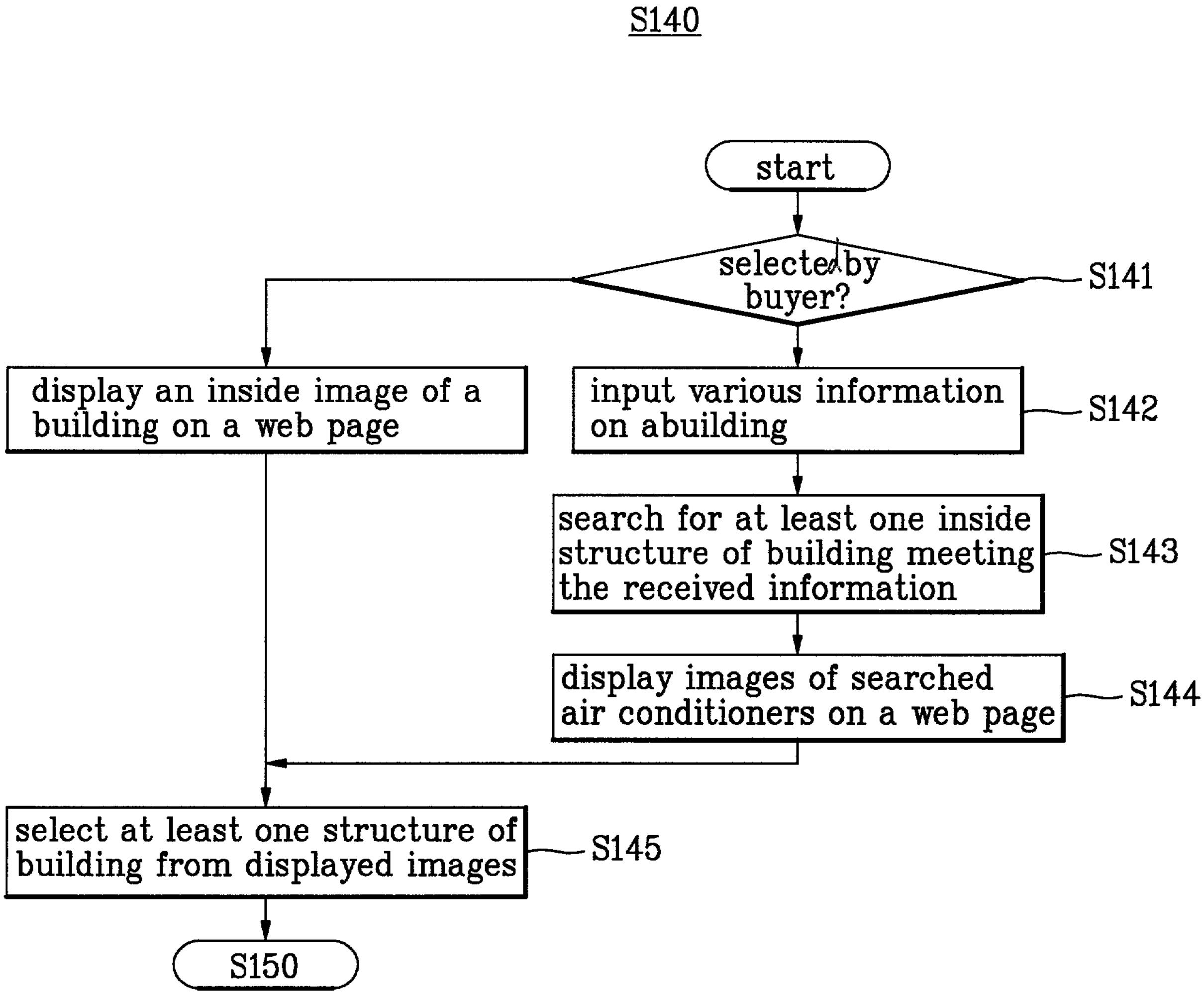
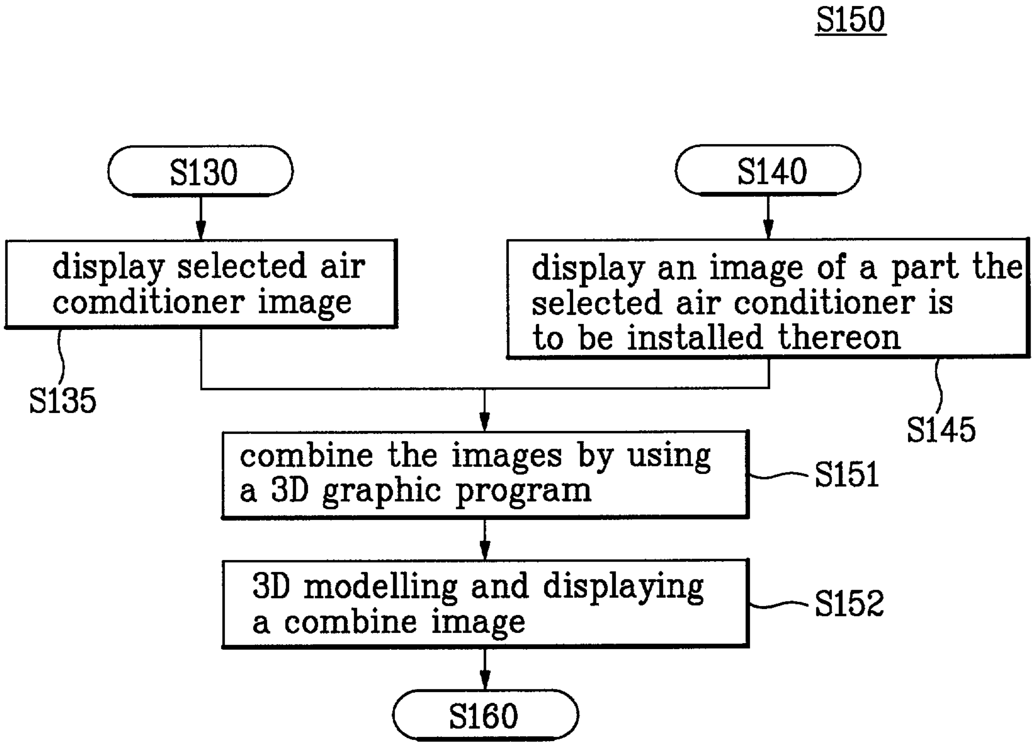

S130
start
selected by buyer?
S131
yes
no
display different air conditioner images on a web page
input information on necessary air conditioner
S132
search for at least one image of air conditioner meeting the received information
S133
display images of searched air conditioners on the web page
S134
select at least one image of air conditioner from displayed imgaes
S135
S150

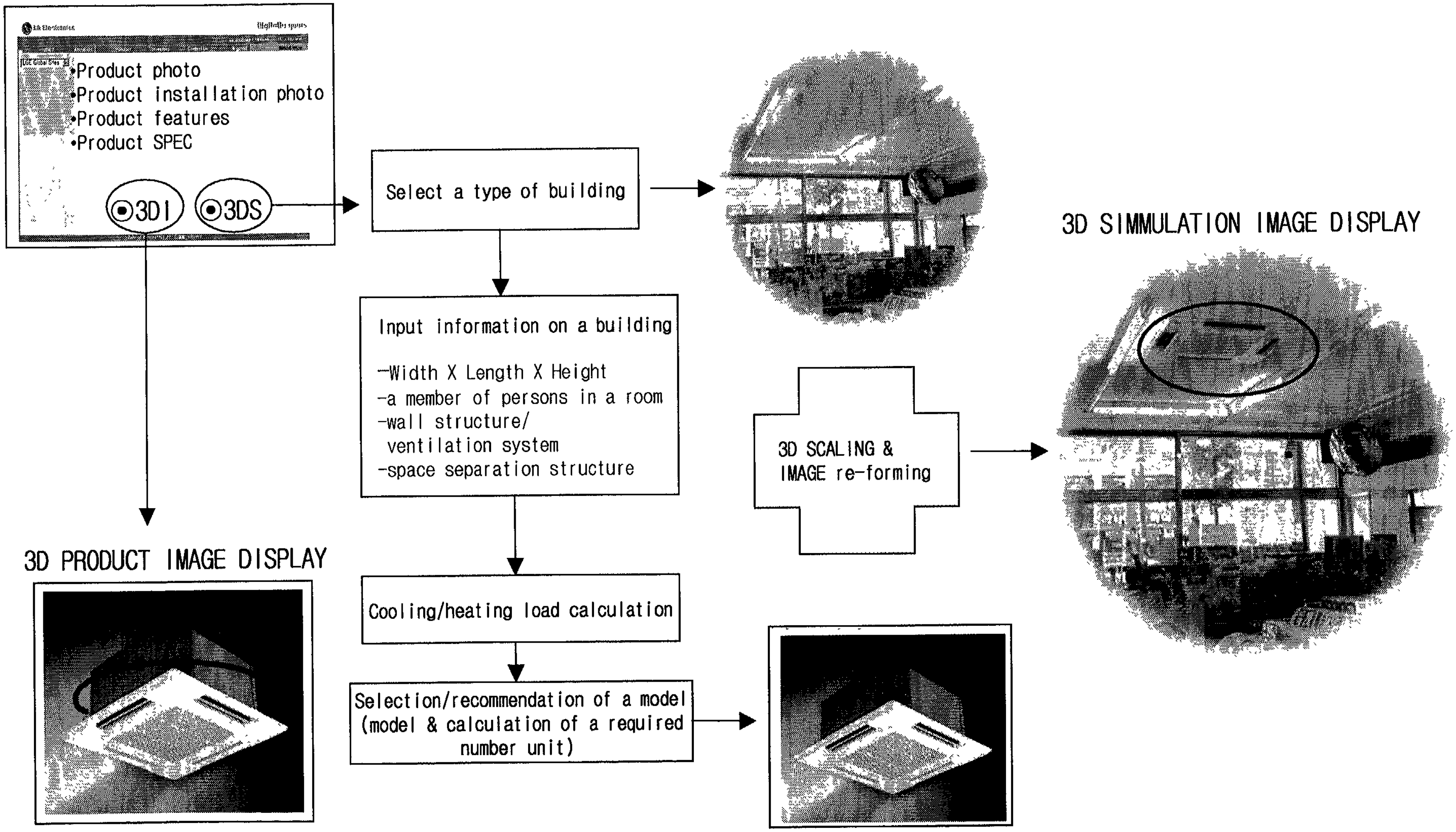
**FIG. 7**


S140
start
selected by buyer?
S141
display an inside image of a building on a web page
input various information on abuilding
S142
search for at least one inside structure of building meeting the received information
S143
display images of searched air conditioners on a web page
S144
select at least one structure of building from displayed images
S145
S150

# FIG.8


S150
S130
S140
display selected air comditioner image
display an image of a part the selected air conditioner is to be installed thereon
S135
S145
combine the images by using a 3D graphic program
S151
3D modelling and displaying a combine image
S152
S160

# FIG.9



•Product photo
•Product installation photo
•Product features
•Product SPEC
⦿3DI
⦿3DS
Select a type of building
Input information on a building
-Width X Length X Height
-a member of persons in a room
-wall structure/ ventilation system
-space separation structure
Cooling/heating load calculation
Selection/recommendation of a model (model & calculation of a required number unit)
3D SCALING & IMAGE re-forming
3D SIMMULATION IMAGE DISPLAY
3D PRODUCT IMAGE DISPLAY

FIG.10

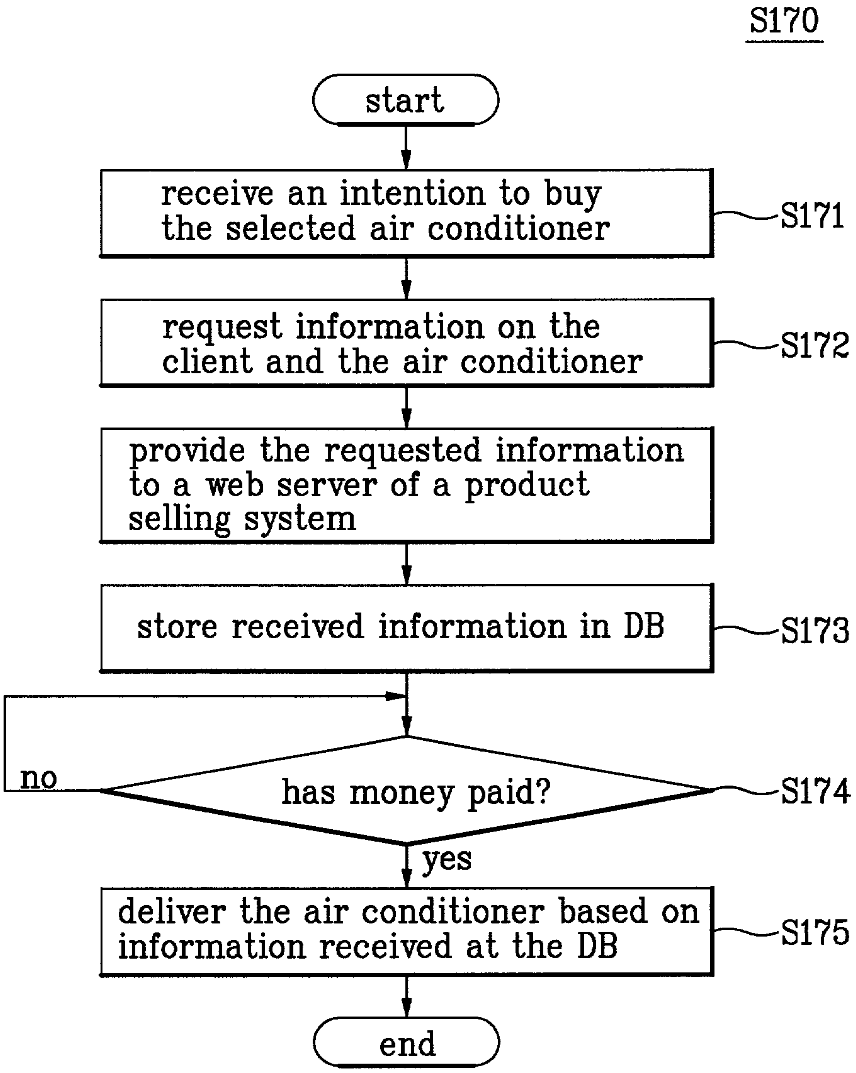

S170
start
receive an intention to buy the selected air conditioner
S171
request information on the client and the air conditioner
S172
provide the requested information to a web server of a product selling system
store received information in DB
S173
has money paid?
no
S174
yes
deliver the air conditioner based on information received at the DB
S175
end

FIG.11

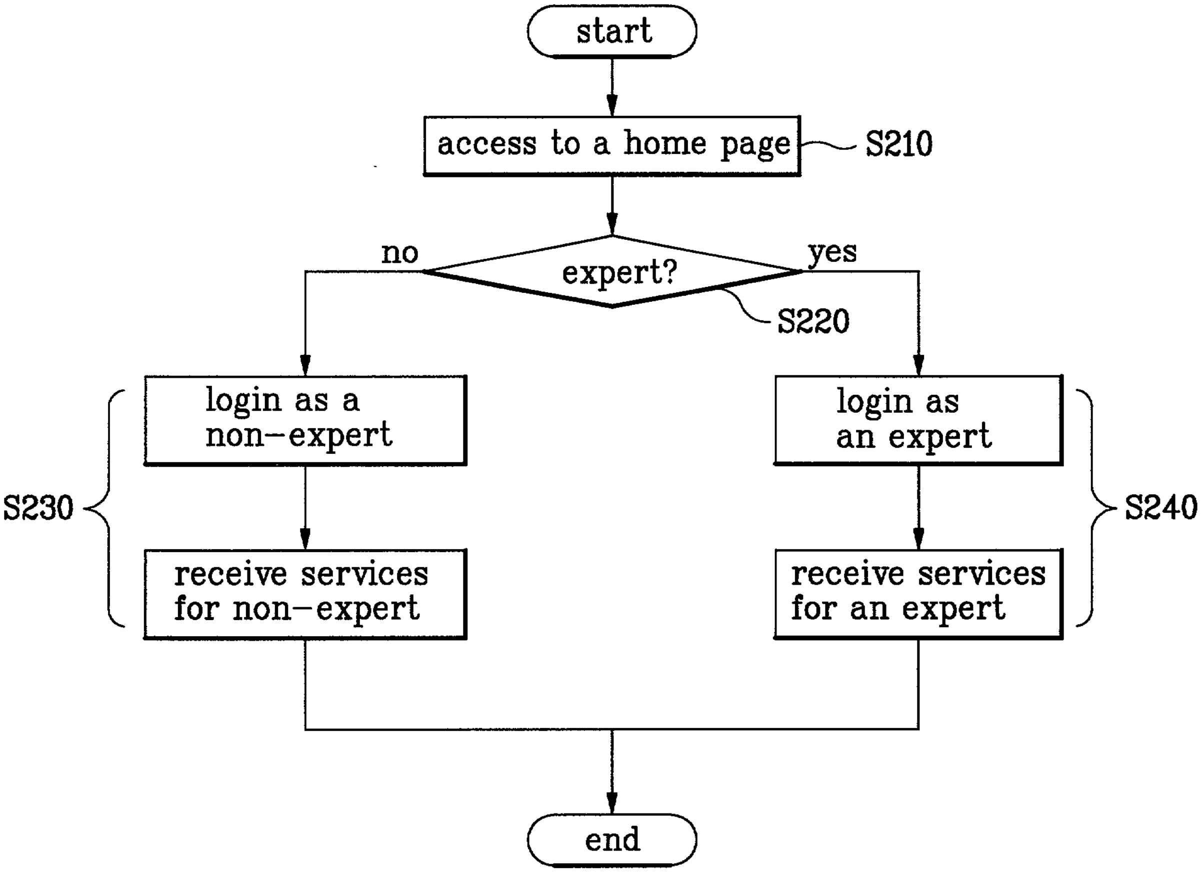

start
access to a home page
S210
expert?
no
yes
S220
login as a non−expert
receive services for non−expert
S230
login as an expert
receive services for an expert
S240
end

FIG.12

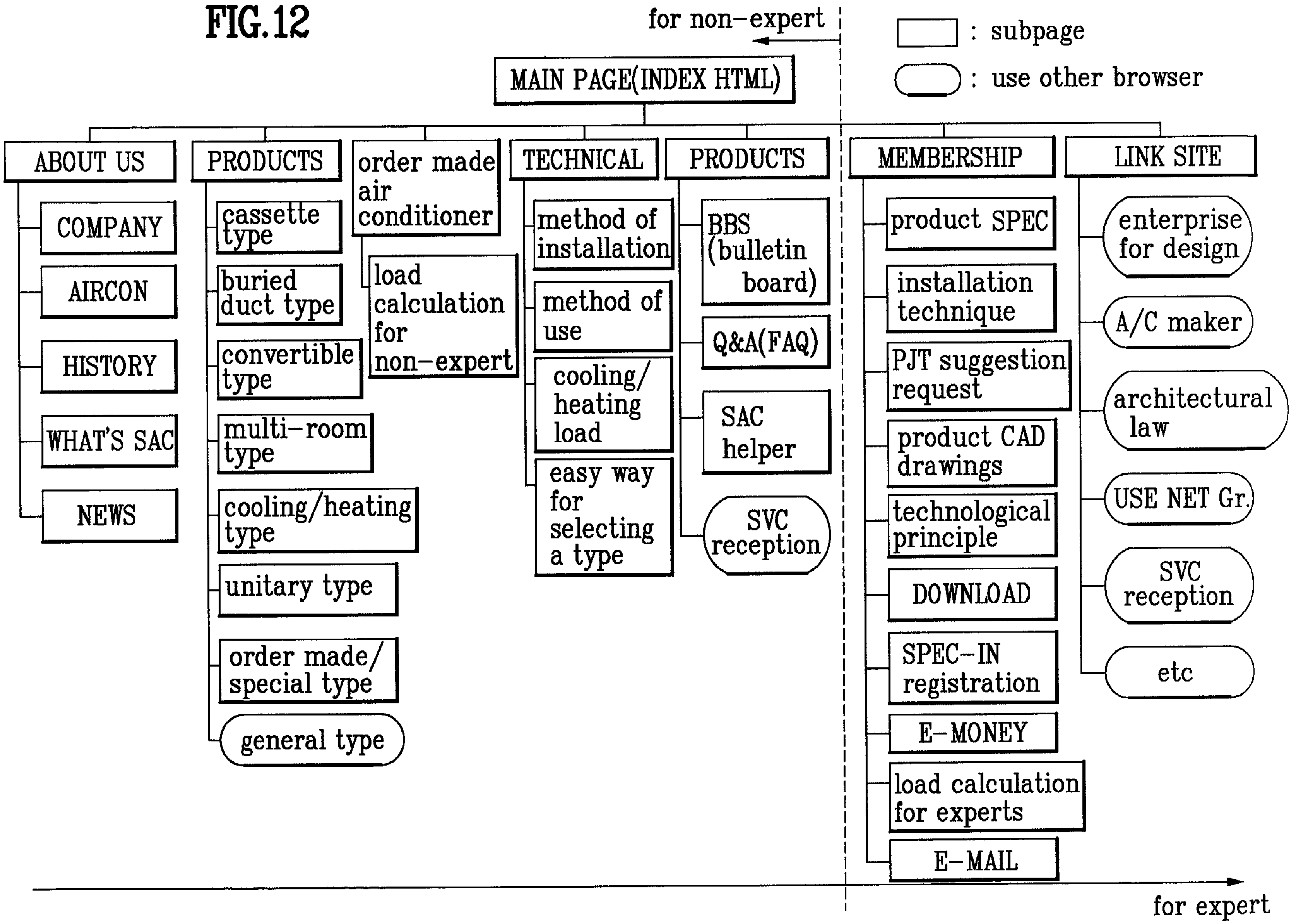
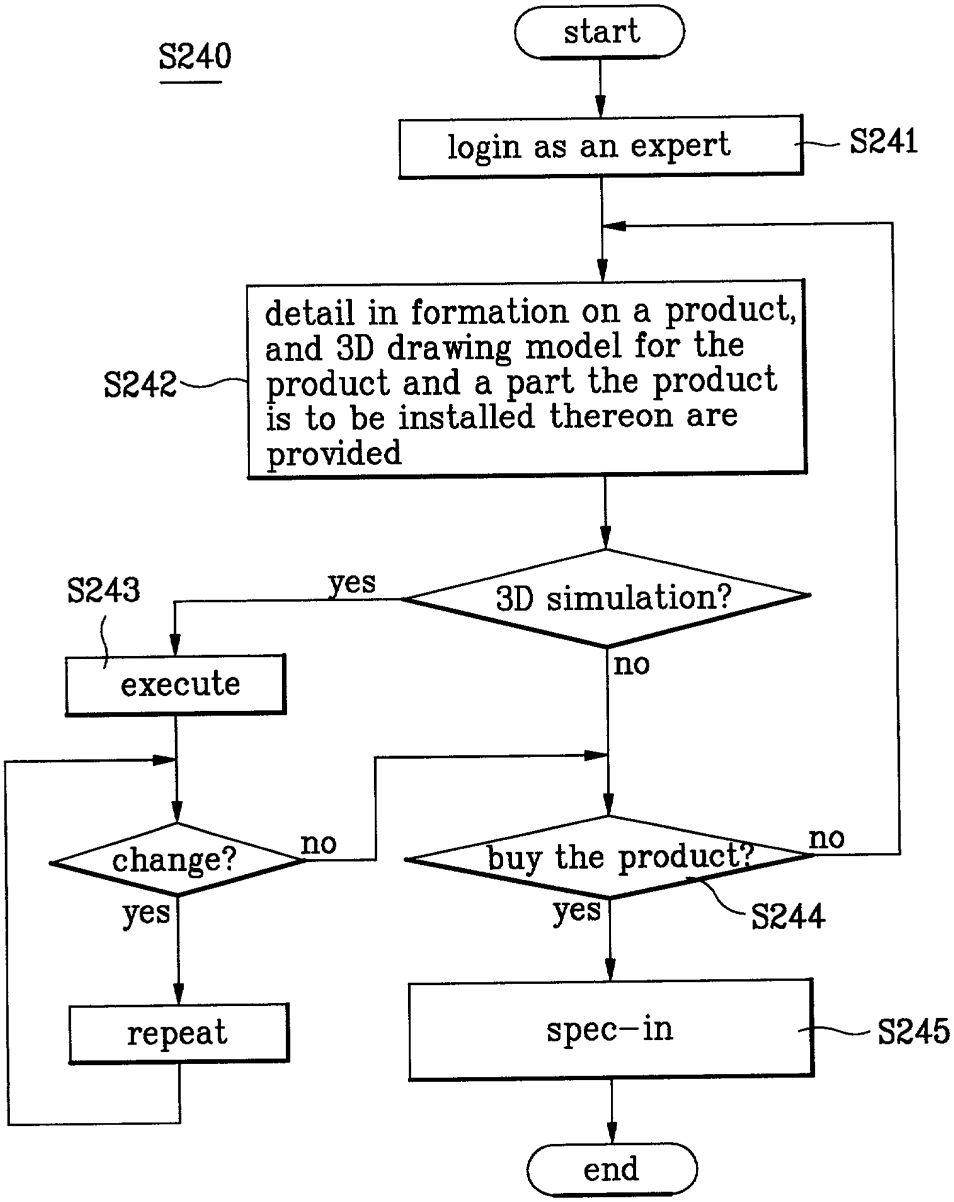
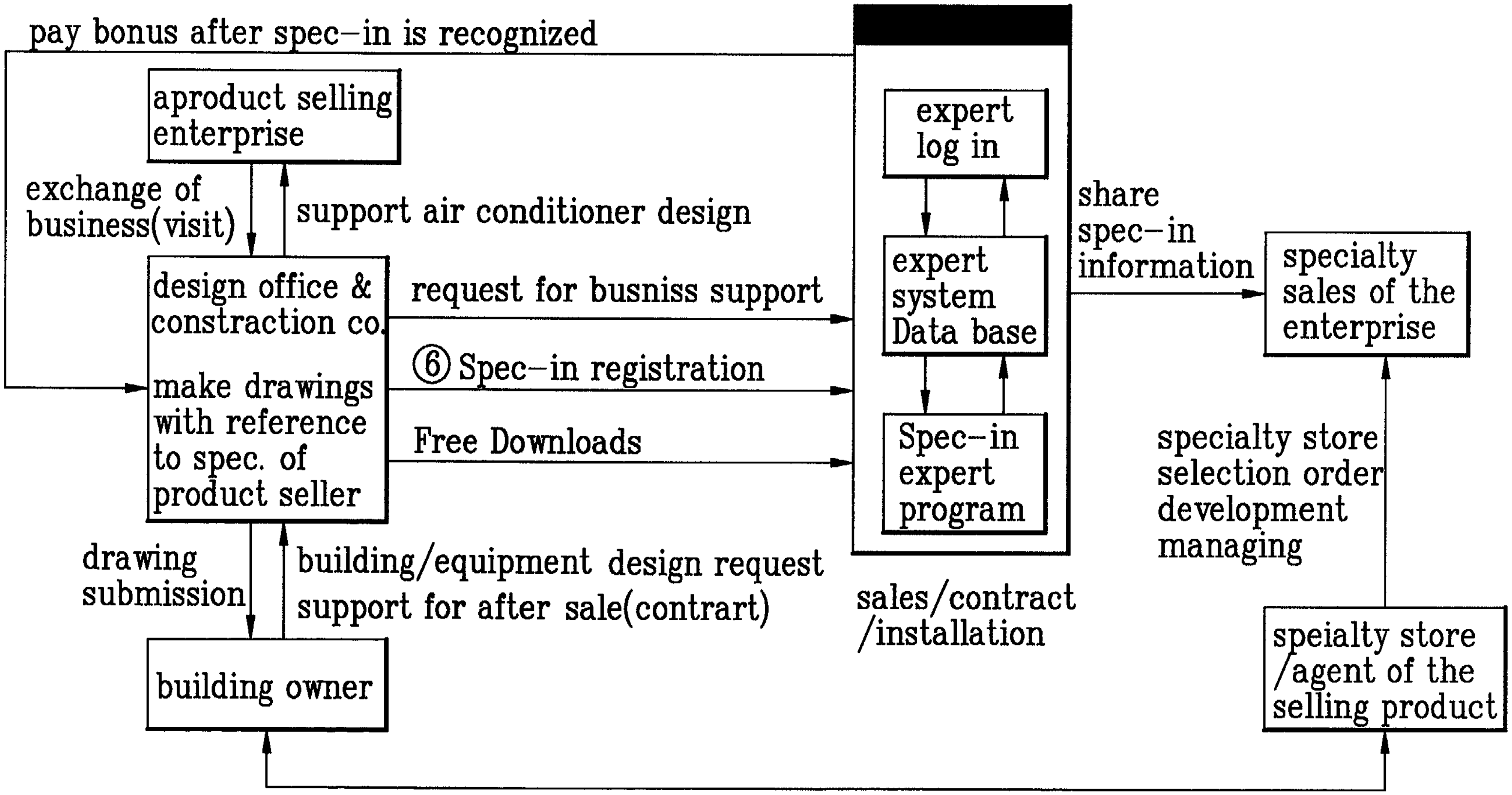

for non-expert
: subpage
: use other browser
MAIN PAGE(INDEX HTML)
ABOUT US
COMPANY
AIRCON
HISTORY
WHAT'S SAC
NEWS
PRODUCTS
cassette type
buried duct type
convertible type
multi-room type
cooling/heating type
unitary type
order made/ special type
general type
order made air conditioner
load calculation for non-expert
TECHNICAL
method of installation
method of use
cooling/ heating load
easy way for selecting a type
PRODUCTS
BBS (bulletin board)
Q&A(FAQ)
SAC helper
SVC reception
MEMBERSHIP
product SPEC
installation technique
PJT suggestion request
product CAD drawings
technological principle
DOWNLOAD
SPEC-IN registration
E-MONEY
load calculation for experts
E-MAIL
LINK SITE
enterprise for design
A/C maker
architectural law
USE NET Gr.
SVC reception
etc
for expert

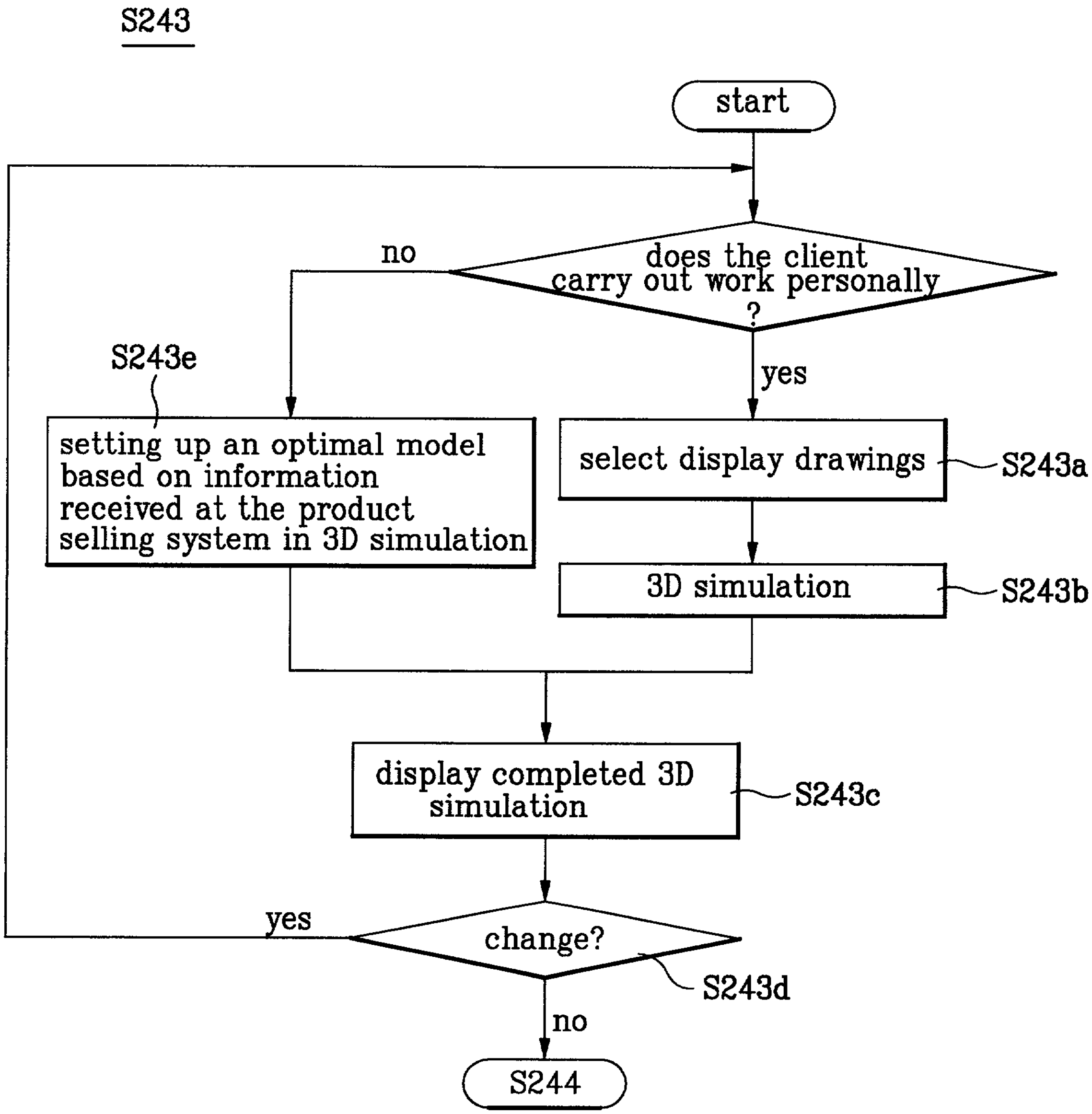
FIG.13


S240
start
login as an expert
S241
detail in formation on a product, and 3D drawing model for the product and a part the product is to be installed thereon are provided
S242
3D simulation?
yes
no
S243
execute
change?
no
yes
repeat
buy the product?
no
yes
S244
spec-in
S245
end

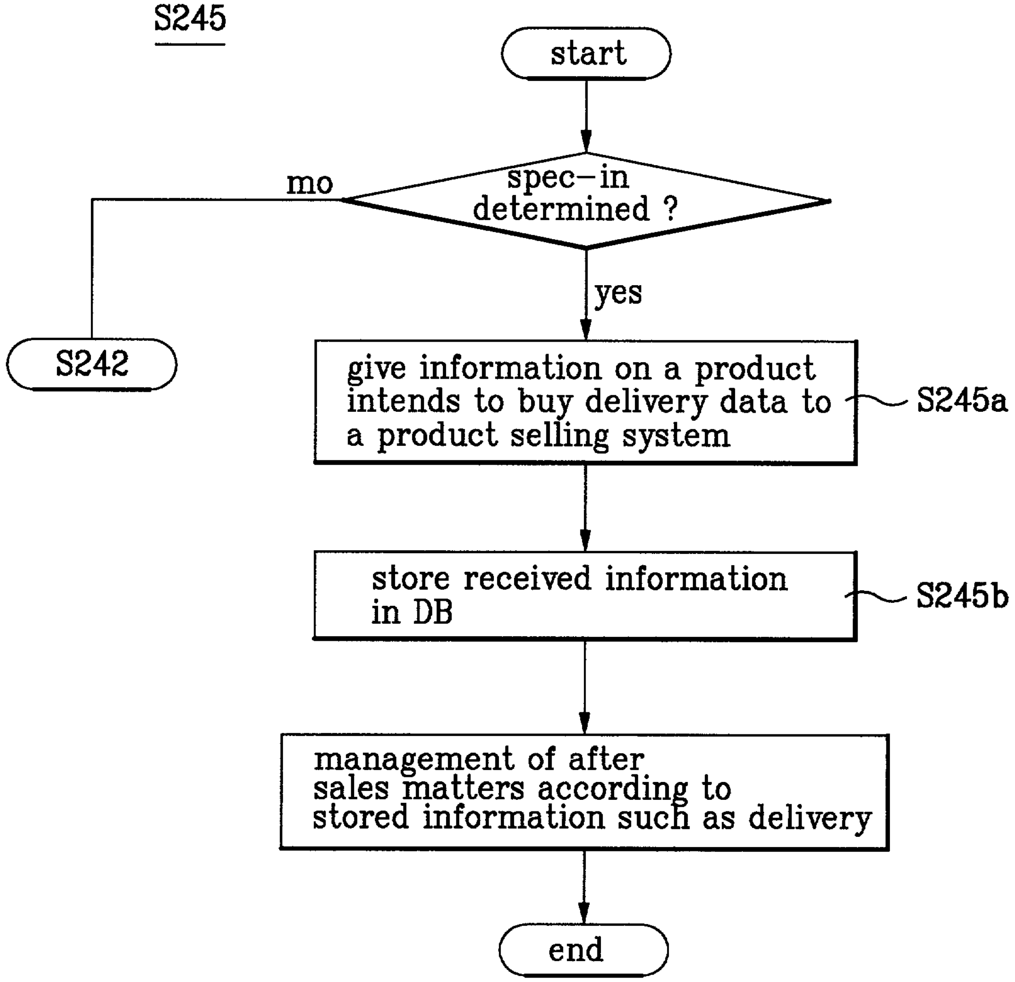
# FIG.14


pay bonus after spec-in is recognized
aproduct selling enterprise
exchange of business(visit)
support air conditioner design
design office & constraction co.
make drawings with reference to spec. of product seller
request for busniss support
⑥ Spec-in registration
Free Downloads
drawing submission
building/equipment design request
support for after sale(contrart)
building owner
expert log in
expert system Data base
Spec-in expert program
sales/contract /installation
share spec-in information
specialty sales of the enterprise
specialty store selection order development managing
speialty store /agent of the selling product

## FIG.15


S243
start
does the client carry out work personally ?
no
yes
S243e
setting up an optimal model based on information received at the product selling system in 3D simulation
select display drawings
S243a
3D simulation
S243b
display completed 3D simulation
S243c
yes
change?
S243d
no
S244

## FIG.16


S245
start
spec-in determined ?
mo
yes
S242
give information on a product intends to buy delivery data to a product selling system
S245a
store received information in DB
S245b
management of after sales matters according to stored information such as delivery
end

# FIG. 17

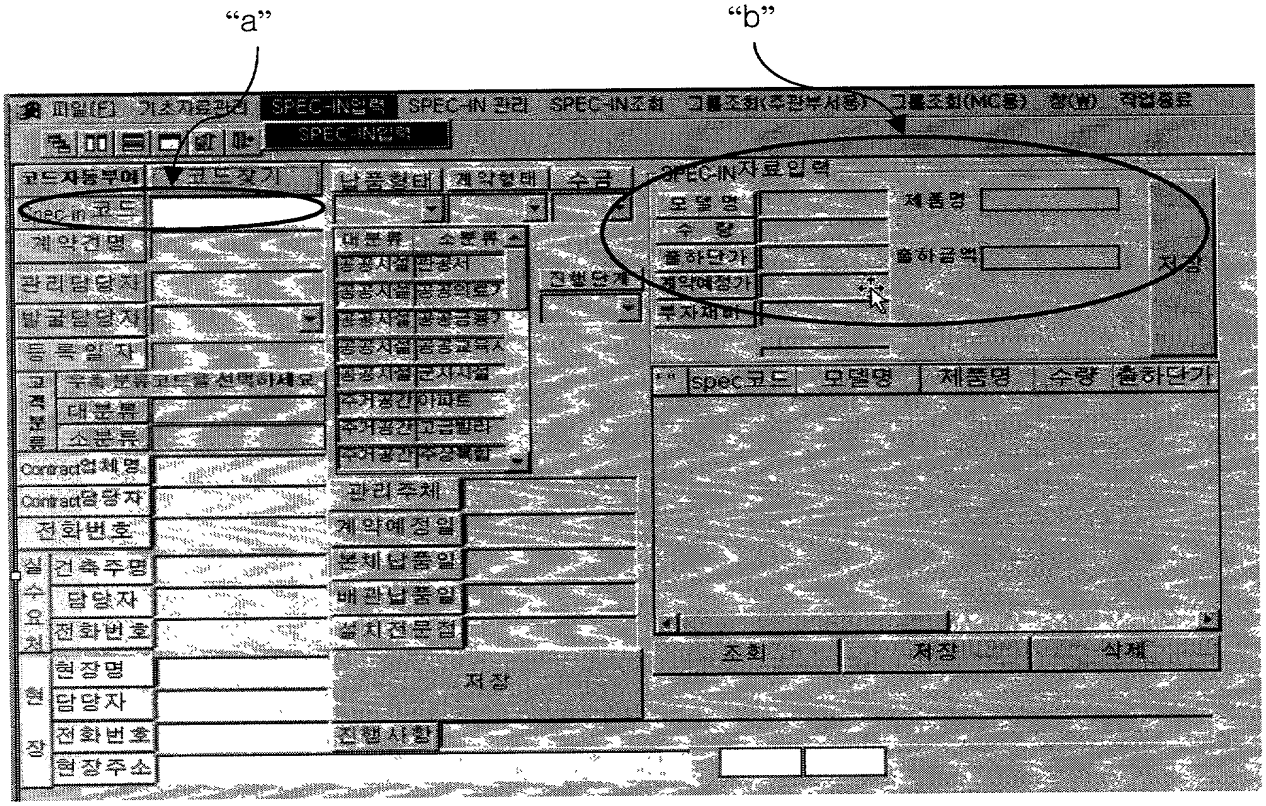
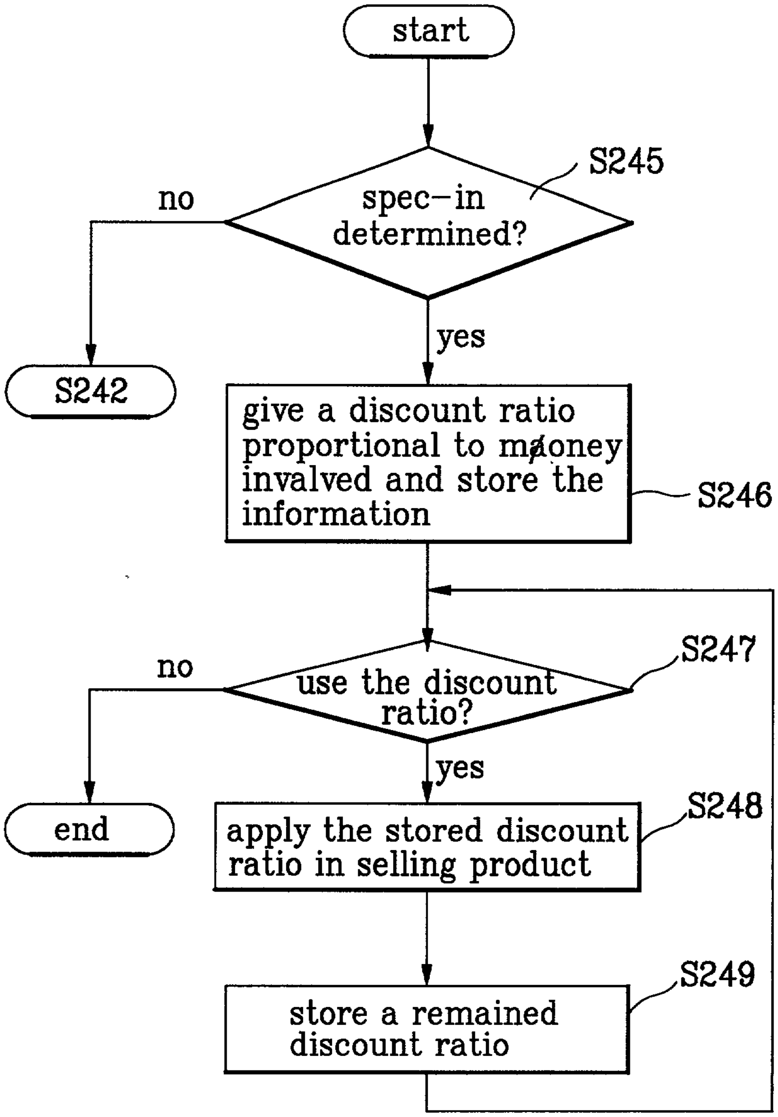

"a"
"b"
파일(F)
기초자료관리
SPEC-IN입력
SPEC-IN 관리
SPEC-IN조회
그룹조회(주관부서용)
그룹조회(MC용)
창(W)
작업종료
SPEC-IN입력
코드자동부여
코드찾기
Spec-in 코드
계약건명
관리담당자
발굴담당자
등록일자
고객분류
수주 분류코드를 선택하세요
대분류
소분류
Contract업체명
Contract담당자
전화번호
실수요처
건축주명
담당자
전화번호
현장
현장명
담당자
전화번호
현장주소
납품형태
계약형태
수금
대분류
소분류
공공시설
관공서
공공시설
공공의료기
공공시설
공공금융기
공공시설
공공교육시
공공시설
군사시설
주거공간
아파트
주거공간
고급빌라
주거공간
주상복합
진행단계
관리주체
계약예정일
본체납품일
배관납품일
설치전문점
저장
진행사항
SPEC-IN자료입력
모델명
수량
출하단가
계약예정가
부자재비
제품명
출하금액
저장
spec코드
모델명
제품명
수량
출하단가
조회
저장
삭제

FIG.18


start
spec–in determined?
S245
no
yes
S242
give a discount ratio proportional to m~~a~~oney invalved and store the information
S246
use the discount ratio?
S247
no
yes
end
apply the stored discount ratio in selling product
S248
store a remained discount ratio
S249

# FIG.19A

| ◆heat transfer loss–inside surface,floor(except outside wall and roof) ⑤ | | | | | |
|---|---|---|---|---|---|
| item | direction coetticient | area | temperature difference | K | heating load |
| cieling | (A) | cb | ⑤ | cj | (D) |
| floor | (A) | cc | ⑤ | ck | (D) |
| partition | (A) | cd | ⑤ | cl | (D) |

| ◆room heat loss–ventilation | | | | |
|---|---|---|---|---|
| item | air volume | temperature difference | coefficient | heating load |
| ventilation | (A) | ⑤ | 0.288 | (F) |

| ◆room heat loss–ventilation | | | | |
|---|---|---|---|---|
| item | coefficient | absolute humidity difference | air volume | amount of added |
| amount | 1.2 | ⑨ | (E) | (F) |
| load | moist amount*600 | | (H) | |

| ◆heating load | sum | Total |
|---|---|---|

FIG.19A

◆heat transfer loss−glass

| item | direction coefficient | area | temperature difference | K | heating load |
|---|---|---|---|---|---|
| glass | (A) | y | ⑤ | ci | (B) |
|  | (A) | y | ⑤ | ci | (B) |
|  | (A) | y | ⑤ | ci | (B) |
|  | (A) | y | ⑤ | ci | (B) |

◆heat transfer loss−outside wall

| item | direction coetticient | area | temperature difference | K | heating load |
|---|---|---|---|---|---|
| outside wall | (A) | bf | ⑤ | bp | (C) |
|  | (A) | bg | ⑤ | bq | (C) |
|  | (A) | bh | ⑤ | br | (C) |
|  | (A) | bi | ⑤ | bs | (C) |
| roof | (A) | bj | ⑤ | bt | (C) |

(A) : direction coefficient
(B) : direction coefficient∗ area∗ temperature difference ∗K
(C) : direction coefficient∗ area∗ temperature difference ∗K
(D) : direction coefficient∗ area∗ temperature difference ∗K
(E) : number ventilation air change
(F) : air volume ∗temperature difference ∗coefficient
(G) : coefficient ∗absolute humidity difference∗ air volume
(H) : amount of added moist ∗600

Total : (B)+(C)+(D)+(F)+(H)

# FIG.19B

▣ heat generation from other apparatuses(kcal/hr)

| apparatus | sensible heat | latent heat | remark |
|---|---|---|---|
| lighting, electric heater(per kw) | 860 | – | |
| fluorescent lamp(per kw) | 1,000 | – | |
| coffee pot 1.0Lit(GAS) | 100 | 25 | |
| toaster 15 x 28 x 23cm(electric heat) | 610 | 110 | |
| domestic stove | 1,800 | 200 | |
| hair dryer for beauty parlor(115v) | 470 | 80 | |
| motor(94~375w) | 1,060 | – | |
| motor(0.375~2.25kw) | 920 | – | |
| motor(2.25~15kw) | 740 | – | |
| refrigerator,fan(0~0.4kw) | 1,140 | – | |
| refrigerator,fan(0.75~3.7kw) | 1,100 | – | |
| refrigerator,fan(3.7~15kw) | 1,000 | – | |

load of incandescent lamp(kcal/h)=watt × 0.86

load of fluorescent lamp(kcal/h)=watt × 1.25 × 0.86
=watt × 1.08

the 1.25 times in the load of fluorescent lamp is for a power consumption of ballast

# FIG.19C

| working state | working state | | 28(°C) | | 27(°C) | | 26(°C) | | 24(°C) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | site | total heat generation | (SH) | (LH) | (SH) | (LH) | (SH) | (LH) | (SH) | (LH) |
| sit on chair | theater | 88 | 44 | 44 | 49 | 39 | 53 | 35 | 58 | 65 |
| light work | school | 101 | 45 | 56 | 49 | 52 | 53 | 48 | 61 | 69 |
| office work | office, hotal, depertment store | 113 | 45 | 68 | 50 | 63 | 54 | 59 | 62 | 72 |
| sit/stand | bank | 126 | 45 | 81 | 50 | 76 | 55 | 71 | 64 | 73 |
| sit and work | dining room/ quest room | 139 | 48 | 91 | 56 | 83 | 62 | 77 | 71 | 81 |
| sit and work | light workate factory | 189 | 48 | 141 | 56 | 133 | 62 | 127 | 74 | 92 |
| general dancing | dance hall | 215 | 56 | 159 | 62 | 153 | 69 | 146 | 82 | 101 |
| walk(4.8km/h) | factory | 252 | 68 | 184 | 76 | 176 | 83 | 169 | 96 | 116 |
| bowling | bowling lane | 365 | 113 | 252 | 117 | 248 | 121 | 244 | 132 | 153 |